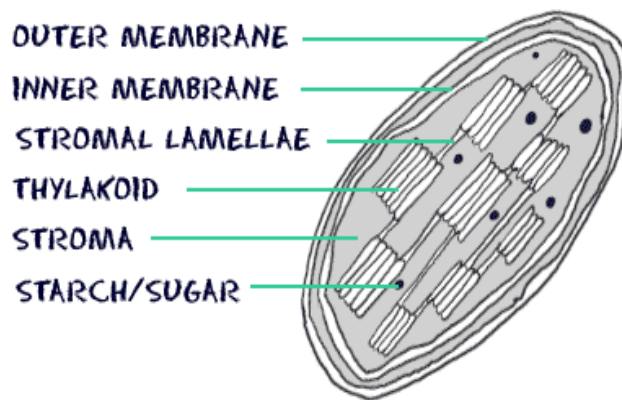
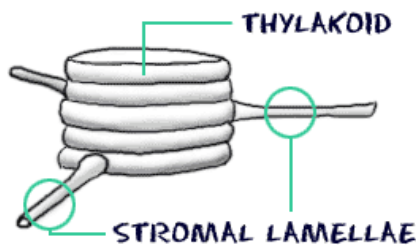


Chloroplasts

Chloroplasts are the food producers of the cell. They are only found in plant cells and some [protists](#). Animal cells do not have chloroplasts. Every green [plant](#) you see is working to convert the energy of the sun into sugars. Plants are the basis of all life on Earth. They create sugars, and the by product of that process is the oxygen that we breathe. That process happens in the chloroplast. [Mitochondria](#) work in the opposite direction and break down the sugars and nutrients that the cell receives.



Special Structures

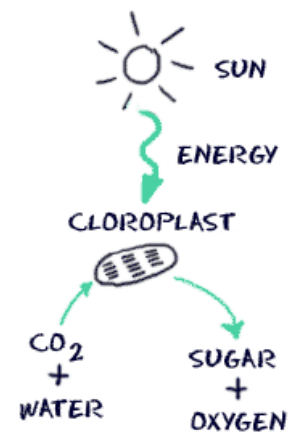


We'll hit the high points for the structure of a chloroplast. Two membranes contain and protect the inner parts of the chloroplast. The **stroma** is an area inside of the chloroplast where reactions occur and starches (sugars) are created. One **thylakoid stack** is called a **granum**. The thylakoids have **chlorophyll** molecules on their surface. That chlorophyll uses sunlight to create sugars. The stacks of sacs are connected by

stromal lamellae. The lamellae act like the skeleton of the chloroplast, keeping all of the sacs a safe distance from each other and maximizing the efficiency of the organelle.

Making Food

The purpose of the chloroplast is to make sugars and starches. They use a process called **photosynthesis** to get the job done. Photosynthesis is the process of a plant taking energy from the Sun and creating sugars. When the energy from the Sun hits a chloroplast, chlorophyll uses that energy to combine carbon dioxide (CO_2) and water (H_2O). The molecular reactions create sugar and oxygen (O_2). Plants and animals then use the sugars (glucose) for food and energy. Animals also use the oxygen to breathe.



Different Chlorophyll Molecules

We said that chlorophyll molecules sit on the outside of the thylakoid sacs. Not all chlorophyll is the same. Three types of chlorophyll can complete photosynthesis. There are even molecules other than chlorophyll that are photosynthetic. One day you might hear about **carotenoids**, **phycocyanin** ([bacteria](#)), **phycoerythrin** (algae), and **fucoxanthin** (brown algae). While those compounds might complete photosynthesis, they are not all green or the same structure as chlorophyll.